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Physical Parameters and Fish Sampling Data from Homathko River Estuary, Bute Inlet in 1987 1988

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ABSTRACT

Choromanski, E. M. and J. S. Macdonald. 1989. Physical parameters and fish sampling data from Homathko River estuary, Bute Inlet in 1987, 1988. Can. Data Rep. Fish. Aquat. Sci. 743: 49 p.

Physical parameters and fish samples collected from different habitat types in the Homathko River and estuary from June 10-12, 1987 and June 29 - July 1, 1988 are presented in this report. Five sites were selected in three different habitats: river, estuary, and the head of Bute Inlet. Fish species captured (beach seine), water temperature (°C), salinity profiles ($^{\circ}/_{\circ\circ}$), current measurements ($m \cdot s^{-1}$), substrate composition and cover estimates are described for each site. Total catch, lengths, and weights of all fish species that were captured are tabulated. Eighteen fish species were identified during the sampling trips. Samples of muscle tissue and stomach contents were collected to obtain baseline estimates of pollutant levels in the tissues of resident fish species and to describe food use in different habitats. Information from this study will be compared to similar information collected from the lower Fraser River.

RÉSUMÉ

Choromanski, E. M. et J. S. Mcdonald. 1989. Physical parameters and fish sampling data from Homathko River estuary, Bute Inlet in 1987, 1988. Can. Data Rep. Fish. Aquat. Sci. 743: 49 p.

Ce rapport traite des paramètres physiques et des échantillons de poissons recueillis dans divers types d'habitats de la rivière Homathko et de son estuaire de 10 au 12 juin 1987 et du 29 juin au 1er juillet 1988. Cinq sites ont été choisis parmi les trois habitats suivants: la rivière, l'estuaire et l'embouchure de l'inlet Bute. Les espèces de poissons pris (à coups de senne du rivage), les températures de l'eau (°C), les profils de salinité ($^{o}/_{oo}$), les mesures des courants ($m \cdot s^{-1}$), la composition du substrat et les estimations de surface ombragée sont fournis pour chaque site. Les prises totales, la longueur et le poids de toutes les espèces de poissons sont donnés sous forme de tableau. On a identifié dix-huit espèces de poissons lors des tournées d'échantillonnage. Des échantillons de tissu musculaire et de substances contenues dans les estomacs ont été prélevés pour obtenir des estimations de base relatives aux niveaux de pollution contenus dans les tissus des espèces de poissons locales et pour décrire les habitudes alimentaires de ces poissons dans divers habitats. Les renseignements contenus dans ce travail de recherche seront comparés à ceux qui ont été recueillis à la suite d'enquêtes faites dans la parite inférieure du fleuve Fraser.

INTRODUCTION

The physical and biological features of many western North American estuaries have been described (Healey 1980, 1982; Levings et al. 1986; Macdonald et al. 1987; Northcote et al. 1976). Many of these studies have compared physical and biological conditions among natural, perturbed and restored habitats (Macdonald et al. 1988). However, in some estuaries industrial and recreation interests have developed to the point that little natural habitat exists for comparative purposes (e.g. the Fraser River).

The Homathko River watershed has little industrial activity and therefore is largely in a natural state. It provides an ideal control for comparison of habitat use, food consumption and contaminant uptake by fish in other, more developed systems.

This report presents data pertaining to the physical (temperature, salinity) and biological features (species composition, habitat use, fish lengths and weights) at various habitats in the Homathko River, the estuary and at the head of the inlet adjacent to the river mouth. As the Homathko is a large river that shares similarities with the Fraser (e.g. turbidity, temperature, presence of many of the same fish species) it is our intention to use these data to compare to similar information being collected from the lower Fraser River. In addition, contaminant levels in tissues sampled from several species of fish captured in this study will be compared to similar samples collected from other, more industrialized river systems.

STUDY AREA

The Homathko River originates on the northern slopes of the Coast Mountains and flows southwesterly through the north interior plateau of British Columbia to its mouth at the head of Bute Inlet (Fig. 1). It flows southward into the largest lake in its system, Tatlayoko Lake, passes by the Waddington and Whitemantle Ranges on the west and by the Homathko Icefield on the east, to finally flow into Bute Inlet. The estuary is 385 ha. The river drains an area of 5720 km^2 and drops from an elevation of 2000 m to sea level. On its way to the inlet it is joined by Mosley Creek, the largest of many tributaries arising from glaciers. The mean annual discharge of the Homathko River at the mouth is 263 m^3/sec (1957-1987; Water Survey of Canada 1988). Peak monthly flow normally occurs in July, lowest monthly flow occurs in March (Fig. 2). The maximum daily discharge at the mouth for the recording record was 2,570 $m^3 \cdot s^{-1}$, on September 6, 1957. The minimum daily discharge was 20.28 $m^3 \cdot s^{-1}$ on November 28, 1985.

Five sites were selected from three habitats: river, estuary, and and at the head of the inlet adjacent to the river mouth. Location of the sites, and a description of their physical parameters at low and high tide are presented in Table IV and Figure 1.

MATERIALS AND METHODS

A 30.5 m beach seine with wings (10 m - 1 cm stretched mesh), a bunt (10 m - 6 mm stretched mesh) and a depth of 3 m was used to sample fish. The net was fitted with 15 m towing lines off the wings. The beach seine was usually set from a 37 kw inflatable boat in a semi-circular pattern. It was set as quickly as possible to minimize the loss of fish and was retrieved to shore by hand. Depending upon site conditions this procedure sampled an area approximately 120 m^2. Replicated sets (2 or 3) were made at high and at low tide. At site D at low tide the seine was set to sample an entire side-channel.

Fish were also sampled with a two-sectional wire mesh minnow trap (Geetrap) baited with canned sardines in plastic bags. Traps were set for approximately 24 hours at sites B and D. Up to 10 traps per site were set in areas of slow to moderate current and adequate cover, such as in log jams, among rooted aquatic plants and submerged debris and under overhanging banks. Few fish were caught using this method, possibly due to the turbidity of the water. The trapping was discontinued after the first year.

Subsamples of the catch from each site were brought aboard the FRV CALIGUS, which acted as our base during the study. They were sorted by species, measured, and stomachs were removed from some species (Dolly Varden, staghorn sculpin, cutthroat). All specimens were measured (fork length) to the nearest millimeter, labelled and stored in 10% formaldehyde. Fish weights in grams were taken at the laboratory using OHAUS Port-O-Gram scale.

Fish species collected for toxic contaminant analysis were wrapped in aluminum foil, prewashed with methylene chloride, and then frozen in plastic bags. Species sampled for contaminants are listed in Table 2.

A Beckman RS-5 salinometer was used to take the measurements of salinity (‰) and temperature (°C) at each site and sampling time. Water temperature was measured with a hand held thermometer. Water velocity ($m \cdot s^{-1}$) was measured by the Marsh-McBirney Model 201 portable water flowmeter.

RESULTS

In total, fourteen species were captured in 1987 (Table 2) and thirteen in 1988 (Table 3). Results of length and weight data for all species are presented in Table 5, using variable codes described in Table 4. Temperature (°C), salinity (‰) and current velocity ($m \cdot s^{-1}$) are presented in Table 6.

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Figure 1. A map of the study area showing the location of sampling sites and geographical features mentioned in the text.

Figure 2. Mean monthly discharge of the Homathko River at the mouth, 1957-1988.

Table 1. Characteristics of the sampling sites, 1987-88.

SITE	T°C		Sal ‰		Curr. ($m \cdot s^{-1}$)		DESCRIPTION
			Tide				
Date	low	high	low	high	low	high	
A							
June 10/87	-	7.3	-	0.0	-	0.05	Collections were made from a sidechannel located approximately 10 km upstream from the mouth on the east side of the Homathko River. The substrate was sandy. One bank of the sidechannel had overhanging vegetation (30%) and cutbank cover (40%). The other bank was a wide shallow sandy beach. Several deep pools were present in the sampled area.
June 30/88	-	7.5	-	0.0	-	0.34	
B							
June 10/87	-	6.9	-	0.0	-	0.05	Collection were made 0.5 km downstream from site A in a back eddy off the main channel on the opposite bank. Substrate was mostly silt or sand. Cover was provided by sunken log debris and roots tree.
June 30/88	-	6.9	-	0.0	-	0.25	
C							
June 10/87	6.3	6.9	0.0	0.3	0.47	0.22	Collections were made on the north side of the Homathko River estuary adjacent to the main streamflow. At low tide it consisted of a sandy beach with scattered log debris and tree stems. At high tide the water level reached a 2 m high cut bank covered with marshes and bushes.
June 29/88	7.2	8.4	0.0	0.7	0.19	0.0	
D							
June 11/87	7.4	6.7	0.3	0.0	0.0	0.05	This brackish water sidechannel was located on the west bank of the river immediately upstream of Cumsack Creek. The substrate was mainly sand and silt. At high tide overhanging trees (35-50%), log debris (30%), marsh, and bush (20-30%) created shoreline cover. Average depth at high tide was 2-3 m but at low tide most of the sidechannel was dried up and samples were taken in a slough at the mouth of the tidal channel.
June 29/88	7.8	8.8	0.0	0.0	0.28	0.0	
E							
June 11/87	8.2	7.6	0.9	0.4	0.0	0.03	This site was situated near the mouth of the river on the northeast shore of Bute Inlet. At low tide sand flats and marsh grasses were exposed. At high tide water extended into large expanses of riparian low lands where low bushes grew.
June 30/88	8.1	9.7	0.5	0.1	0.0	0.0	

Table 2. Composition by number of species caught at each station in Homathko River and estuary in 1987. High and low tide collections are combined.

Species	A	B	C	D	E
CHINOOK FRY	4	180	19	46	3
STARRY FLOUNDER*	0	0	54	6	39
PRICKLY SCULPIN*	1	3	5	1	58
COHO FRY	5	29	17	2	6
CHINOOK SMOLT*	0	5	7	10	1
DOLLY VARDEN	0	1	3	6	12
STICKLEBACK*	0	0	4	0	4
LARGESCALE SUCKER	2	2	0	0	0
STAGHORN SCULPIN*	0	0	3	0	0
LONGNOSE DACE	1	2	0	0	0
EULACHON*	0	0	2	0	0
COHO SMOLT	0	1	0	0	1
SOCKEYE SMOLT	0	2	0	0	0
LONGFIN SMELT	0	0	0	0	1
SURF SMELT	0	0	0	0	1
CUTTHROAT TROUT	0	0	0	0	1
TOTAL	13	223	115	71	125
Number of sets	1	3	6	4	6

* Species from which tissue samples were taken for contaminants analysis

Table 3. Composition by number of species caught at each station in Homathko River and estuary in 1988. High and low tide collections are combined.

Species	A	B	C	D	E
STARRY FLOUNDER*	0	0	40	45	16
CHINOOK FRY	11	17	2	8	0
STAGHORN SCULPIN*	0	0	0	0	35
DOLLY VARDEN	0	0	2	8	15
COHO FRY	0	0	3	12	6
CHINOOK SMOLT*	1	3	2	6	6
STICKLEBACK*	0	0	2	0	2
LONGNOSE SUCKER	4	0	0	0	0
COASTRANGE SCULPIN	3	0	0	1	0
STEELHEAD TROUT	0	0	0	2	2
PRICKLY SCULPIN*	0	0	0	3	0
COHO SMOLT*	0	0	1	1	0
CUTTHROAT TROUT	0	0	0	0	2
HERRING	0	0	0	0	1
SOCKEYE SMOLT	1	0	0	0	0
TOTAL	16	20	50	73	84
Number of sets	3	3	4	6	6

* Species from which tissue samples were taken for contaminants analysis

Table 4. Variable codes for data in Tables 5 and 6 are as follows:

FISHCOD - record number
SPECIES - each species has a code number, these are:

01 - STARRY FLOUNDER	(Platichthys stellatus)
03 - THREESPINE STICKLEBACK	(Gasterosteus aculeatus)
04 - PRICKLY SCULPIN	(Cottus asper)
05 - STAGHORN SCULPIN	(Leptocottus armatus)
06 - LONGFIN SMELT	(Spirinchus thaleichthys)
11 - EULACHON	(Thaleichthys pacificus)
15 - LONGNOSE SUCKER	(Catostomus catostomus)
16 - LARGESCALE SUCKER	(Catostomus macrocheilus)
17 - LONGNOSE DACE	(Rhinichthys cataractae)
20 - COASTRANGE SCULPIN	(Cottus aleuticus)
23 - PACIFIC HERRING	(Clupea harengus pallasi)
30 - COHO FRY	(Oncorhynchus kisutch)
31 - CHINOOK FRY	(Oncorhynchus tshawytscha)
32 - COHO SMOLT	(Oncorhynchus kisutch)
33 - CHINOOK SMOLT	(Oncorhynchus tshawytscha)
34 - DOLLY VARDEN	(Salvelinus malma)
35 - SOCKEYE SMOLT	(Oncorhynchus nerka)
36 - SURF SMELT	(Hypomesus pretiosus)
37 - CUTTHROAT TROUT	(Salmo clarki)
43 - STEELHEAD TROUT	(Salmo gairdneri)

STATION - sampling stations A, B, C, D and E on Figure 2
DATE - sampling date (year, month, day)
TIME - sampling time (Pacific Standard Time)
TIDE - high tide - 1
low tide - 2
LENGTH - length in mm
- 99 - missing data
WEIGHT - fish wet weight in g
- 11.1 - missing data
TEMP. - water temperature (°C)
SAL. - salinity (‰)
Curr. - water current ($m \cdot s^{-1}$)

Table 5. Length and weight data for all species sampled in the Homathko River and estuary in 1987 and 1988. Missing values are given as -99 (length) or 11.1 (weight).

FISHCOD	SPECIES	STATION	DATE	TIME	LENGTH	WEIGHT
1	31	A	870610	1620	57	2.7
2	31	A	870610	1620	49	1.9
3	31	A	870610	1620	47	1.6
4	31	A	870610	1620	40	1.0
5	30	A	870610	1620	39	1.0
6	30	A	870610	1620	33	0.6
7	30	A	870610	1620	32	0.5
8	30	A	870610	1620	38	0.6
9	30	A	870610	1620	32	0.5
10	4	A	870610	1620	52	2.2
11	16	A	870610	1620	49	1.8
12	16	A	870610	1620	240	-11.1
13	17	A	870610	1620	-99	-11.1
14	30	B	870610	1720	50	1.9
15	30	B	870610	1720	42	1.2
16	30	B	870610	1720	37	0.7
17	30	B	870610	1720	42	1.0
18	30	B	870610	1720	36	0.6
19	30	B	870610	1720	36	0.7
20	30	B	870610	1720	34	0.5
21	30	B	870610	1720	33	0.6
22	30	B	870610	1720	31	0.5
23	30	B	870610	1720	30	0.4
24	30	B	870610	1720	33	0.5
25	31	B	870610	1720	59	2.6
26	31	B	870610	1720	55	2.0
27	31	B	870610	1720	52	1.9
28	31	B	870610	1720	59	2.6
29	31	B	870610	1720	41	1.2
30	31	B	870610	1720	45	1.2
31	31	B	870610	1720	42	1.0
32	31	B	870610	1720	42	1.0
33	31	B	870610	1720	41	0.9
34	31	B	870610	1720	44	1.0
35	31	B	870610	1720	40	0.8
36	31	B	870610	1720	38	0.7
37	31	B	870610	1720	31	0.4
38	31	B	870610	1720	35	0.5
39	31	B	870610	1720	32	0.3
40	31	B	870610	1720	31	0.3
41	16	B	870610	1720	71	4.7
42	16	B	870610	1720	46	1.6
43	30	B	870610	1720	-99	-11.1
44	30	B	870610	1720	-99	-11.1
45	30	B	870610	1720	-99	-11.1
46	30	B	870610	1720	-99	-11.1
47	30	B	870610	1720	-99	-11.1
48	30	B	870610	1720	-99	-11.1
49	30	B	870610	1720	-99	-11.1

FISHCOD	SPECIES	STATION	DATE	TIME	LENGTH	WEIGHT
50	31	B	870610	1720	-99	-11.1
51	30	B	870610	1720	-99	-11.1
52	30	B	870610	1720	-99	-11.1
53	30	B	870610	1720	-99	-11.1
54	30	B	870610	1720	-99	-11.1
55	30	B	870610	1720	-99	-11.1
56	30	B	870610	1720	-99	-11.1
57	30	B	870610	1720	-99	-11.1
58	30	B	870610	1720	-99	-11.1
59	30	B	870610	1720	-99	-11.1
60	30	B	870610	1720	-99	-11.1
61	32	B	870610	1720	-99	-11.1
62	31	B	870610	1720	-99	-11.1
63	30	B	870610	1720	-99	-11.1
64	31	B	870610	1720	-99	-11.1
65	31	B	870610	1720	-99	-11.1
66	31	B	870610	1720	-99	-11.1
67	31	B	870610	1720	-99	-11.1
68	31	B	870610	1720	-99	-11.1
69	31	B	870610	1720	-99	-11.1
70	31	B	870610	1720	-99	-11.1
71	31	B	870610	1720	-99	-11.1
72	31	B	870610	1720	-99	-11.1
73	31	B	870610	1720	-99	-11.1
74	31	B	870610	1720	-99	-11.1
75	31	B	870610	1720	-99	-11.1
76	31	B	870610	1720	-99	-11.1
77	31	B	870610	1720	-99	-11.1
78	31	B	870610	1720	-99	-11.1
79	31	B	870610	1720	-99	-11.1
80	31	B	870610	1720	-99	-11.1
81	31	B	870610	1720	-99	-11.1
82	31	B	870610	1720	-99	-11.1
83	31	B	870610	1720	-99	-11.1
84	31	B	870610	1720	-99	-11.1
85	31	B	870610	1720	-99	-11.1
86	31	B	870610	1720	-99	-11.1
87	31	B	870610	1720	-99	-11.1
88	31	B	870610	1720	-99	-11.1
89	31	B	870610	1720	-99	-11.1
90	31	B	870610	1720	-99	-11.1
91	31	B	870610	1720	-99	-11.1
92	31	B	870610	1720	-99	-11.1
93	31	B	870610	1720	-99	-11.1
94	31	B	870610	1720	-99	-11.1
95	31	B	870610	1720	-99	-11.1
96	31	B	870610	1720	-99	-11.1
97	31	B	870610	1720	-99	-11.1
98	31	B	870610	1720	-99	-11.1

FISHCOD	SPECIES	STATION	DATE	TIME	LENGTH	WEIGHT
99	31	B	870610	1720	-99	-11.1
100	31	B	870610	1720	-99	-11.1
101	31	B	870610	1720	-99	-11.1
102	31	B	870610	1720	-99	-11.1
103	31	B	870610	1720	-99	-11.1
104	31	B	870610	1720	-99	-11.1
105	31	B	870610	1720	-99	-11.1
106	31	B	870610	1720	-99	-11.1
107	31	B	870610	1720	-99	-11.1
108	31	B	870610	1720	-99	-11.1
109	31	B	870610	1720	-99	-11.1
110	31	B	870610	1720	-99	-11.1
111	31	B	870610	1720	-99	-11.1
112	31	B	870610	1720	-99	-11.1
113	31	B	870610	1720	-99	-11.1
114	31	B	870610	1720	-99	-11.1
115	31	B	870610	1720	-99	-11.1
116	31	B	870610	1720	-99	-11.1
117	31	B	870610	1720	-99	-11.1
118	31	B	870610	1720	-99	-11.1
119	31	B	870610	1720	-99	-11.1
120	31	B	870610	1720	-99	-11.1
121	31	B	870610	1720	-99	-11.1
122	31	B	870610	1720	-99	-11.1
123	31	B	870610	1720	-99	-11.1
124	31	B	870610	1720	-99	-11.1
125	31	B	870610	1720	-99	-11.1
126	31	B	870610	1720	-99	-11.1
127	31	B	870610	1720	-99	-11.1
128	31	B	870610	1720	-99	-11.1
129	31	B	870610	1720	-99	-11.1
130	31	B	870610	1720	-99	-11.1
131	31	B	870610	1720	-99	-11.1
132	31	B	870610	1720	-99	-11.1
133	31	B	870610	1720	-99	-11.1
134	31	B	870610	1720	-99	-11.1
135	31	B	870610	1720	-99	-11.1
136	31	B	870610	1720	-99	-11.1
137	31	B	870610	1720	-99	-11.1
138	31	B	870610	1720	-99	-11.1
139	31	B	870610	1720	-99	-11.1
140	31	B	870610	1720	-99	-11.1
141	31	B	870610	1720	-99	-11.1
142	31	B	870610	1720	-99	-11.1
143	31	B	870610	1720	-99	-11.1
144	31	B	870610	1720	-99	-11.1
145	31	B	870610	1720	-99	-11.1
146	31	B	870610	1720	-99	-11.1
147	31	B	870610	1720	-99	-11.1

FISHCOD	SPECIES	STATION	DATE	TIME	LENGTH	WEIGHT
148	31	B	870610	1720	-99	-11.1
149	31	B	870610	1720	-99	-11.1
150	31	B	870610	1720	-99	-11.1
151	31	B	870610	1720	-99	-11.1
152	31	B	870610	1720	-99	-11.1
153	31	B	870610	1720	-99	-11.1
154	31	B	870610	1720	-99	-11.1
155	31	B	870610	1720	-99	-11.1
156	31	B	870610	1720	-99	-11.1
157	31	B	870610	1720	-99	-11.1
158	31	B	870610	1720	-99	-11.1
159	33	B	870610	1720	-99	-11.1
160	33	B	870610	1720	-99	-11.1
161	33	B	870610	1720	-99	-11.1
162	33	B	870610	1720	-99	-11.1
163	33	B	870610	1720	-99	-11.1
164	31	B	870610	1720	-99	-11.1
165	31	B	870610	1720	-99	-11.1
166	31	B	870610	1720	-99	-11.1
167	31	B	870610	1720	-99	-11.1
168	31	B	870610	1720	-99	-11.1
169	31	B	870610	1720	-99	-11.1
170	31	B	870610	1720	-99	-11.1
171	31	B	870610	1720	-99	-11.1
172	31	B	870610	1720	-99	-11.1
173	31	B	870610	1720	-99	-11.1
174	31	B	870610	1720	-99	-11.1
175	31	B	870610	1720	-99	-11.1
176	31	B	870610	1720	-99	-11.1
177	31	B	870610	1720	-99	-11.1
178	31	B	870610	1720	-99	-11.1
179	31	B	870610	1720	-99	-11.1
180	31	B	870610	1720	-99	-11.1
181	31	B	870610	1720	-99	-11.1
182	31	B	870610	1720	-99	-11.1
183	31	B	870610	1720	-99	-11.1
184	31	B	870610	1720	-99	-11.1
185	31	B	870610	1720	-99	-11.1
186	31	B	870610	1720	-99	-11.1
187	31	B	870610	1720	-99	-11.1
188	31	B	870610	1720	-99	-11.1
189	31	B	870610	1720	-99	-11.1
190	31	B	870610	1720	-99	-11.1
191	31	B	870610	1720	-99	-11.1
192	31	B	870610	1720	-99	-11.1
193	31	B	870610	1720	-99	-11.1
194	31	B	870610	1720	-99	-11.1
195	31	B	870610	1720	-99	-11.1
196	31	B	870610	1720	-99	-11.1

FISHCOD	SPECIES	STATION	DATE	TIME	LENGTH	WEIGHT
197	31	B	870610	1720	-99	-11.1
198	31	B	870610	1720	-99	-11.1
199	31	B	870610	1720	-99	-11.1
200	31	B	870610	1720	-99	-11.1
201	31	B	870610	1720	-99	-11.1
202	31	B	870610	1720	-99	-11.1
203	31	B	870610	1720	-99	-11.1
204	31	B	870610	1720	-99	-11.1
205	31	B	870610	1720	-99	-11.1
206	31	B	870610	1720	-99	-11.1
207	31	B	870610	1720	-99	-11.1
208	31	B	870610	1720	-99	-11.1
209	31	B	870610	1720	-99	-11.1
210	31	B	870610	1720	-99	-11.1
211	31	B	870610	1720	-99	-11.1
212	31	B	870610	1720	-99	-11.1
213	31	B	870610	1720	-99	-11.1
214	31	B	870610	1720	-99	-11.1
215	31	B	870610	1720	-99	-11.1
216	31	B	870610	1720	-99	-11.1
217	31	B	870610	1720	-99	-11.1
218	31	B	870610	1720	-99	-11.1
219	31	B	870610	1720	-99	-11.1
220	31	B	870610	1720	-99	-11.1
221	31	B	870610	1720	-99	-11.1
222	31	B	870610	1720	-99	-11.1
223	31	B	870610	1720	-99	-11.1
224	31	B	870610	1720	-99	-11.1
225	31	B	870610	1720	-99	-11.1
226	31	B	870610	1720	-99	-11.1
227	31	B	870610	1720	-99	-11.1
228	31	B	870610	1720	-99	-11.1
229	4	B	870610	1720	-99	-11.1
230	4	B	870610	1720	-99	-11.1
231	4	B	870610	1720	-99	-11.1
232	17	B	870610	1720	-99	-11.1
233	17	B	870610	1720	-99	-11.1
234	34	B	870610	1720	235	-11.1
235	35	B	870610	1720	-99	-11.1
236	35	B	870610	1720	-99	-11.1
791	31	B	870610	1720	-99	-11.1
792	31	B	870610	1720	-99	-11.1
237	30	C	870610	1800	45	1.4
238	30	C	870610	1800	33	0.6
239	30	C	870610	1800	31	0.6
240	30	C	870610	1800	34	0.6
241	30	C	870610	1800	32	0.5
242	30	C	870610	1800	33	0.5
243	30	C	870610	1800	30	0.4

FISHCOD	SPECIES	STATION	DATE	TIME	LENGTH	WEIGHT
244	31	C	870610	1800	29	0.3
245	31	C	870610	1800	48	1.7
246	31	C	870610	1800	28	0.3
247	11	C	870610	1800	148	29.8
248	11	C	870610	1800	131	24.0
249	33	C	870610	1800	-99	-11.1
250	33	C	870610	1800	-99	-11.1
251	33	C	870610	1800	-99	-11.1
252	33	C	870610	1800	-99	-11.1
253	33	C	870610	1800	-99	-11.1
254	3	C	870610	1800	-99	-11.1
255	3	C	870610	1800	-99	-11.1
256	3	C	870610	1800	-99	-11.1
257	3	C	870610	1800	-99	-11.1
258	1	C	870610	1800	-99	-11.1
259	1	C	870610	1800	-99	-11.1
260	1	C	870610	1800	-99	-11.1
261	1	C	870610	1800	-99	-11.1
262	1	C	870610	1800	-99	-11.1
263	1	C	870610	1800	-99	-11.1
264	1	C	870610	1800	-99	-11.1
265	1	C	870610	1800	-99	-11.1
266	1	C	870610	1800	-99	-11.1
267	1	C	870610	1800	-99	-11.1
268	1	C	870610	1800	-99	-11.1
269	1	C	870610	1800	-99	-11.1
270	1	C	870610	1800	-99	-11.1
271	1	C	870610	1800	-99	-11.1
272	1	C	870610	1800	-99	-11.1
273	1	C	870610	1800	-99	-11.1
274	1	C	870610	1800	-99	-11.1
275	1	C	870610	1800	-99	-11.1
276	1	C	870610	1800	-99	-11.1
277	1	C	870610	1800	-99	-11.1
278	30	C	870611	1030	45	1.2
279	30	C	870611	1030	35	0.7
280	30	C	870611	1030	31	0.3
281	30	C	870611	1030	32	0.5
282	30	C	870611	1030	30	0.4
283	30	C	870611	1030	29	0.4
284	30	C	870611	1030	30	0.4
285	30	C	870611	1030	30	0.4
286	31	C	870611	1030	59	2.5
287	31	C	870611	1030	58	2.5
288	31	C	870611	1030	48	1.3
289	31	C	870611	1030	48	1.5
290	31	C	870611	1030	52	1.9
291	31	C	870611	1030	44	1.2
292	31	C	870611	1030	41	1.0

FISHCOD	SPECIES	STATION	DATE	TIME	LENGTH	WEIGHT
293	31	C	870611	1030	40	1.0
294	31	C	870611	1030	38	0.8
295	31	C	870611	1030	33	0.5
296	31	C	870611	1030	31	0.4
297	1	C	870611	1030	19	0.2
298	1	C	870611	1030	24	0.3
299	1	C	870611	1030	21	0.2
300	1	C	870611	1030	21	0.2
301	1	C	870611	1030	17	0.2
302	1	C	870611	1030	16	0.1
303	1	C	870611	1030	16	0.1
304	1	C	870611	1030	17	0.2
305	1	C	870611	1030	19	0.2
306	1	C	870611	1030	17	0.2
307	1	C	870611	1030	14	0.0
308	1	C	870611	1030	12	0.0
309	1	C	870611	1030	13	0.0
310	1	C	870611	1030	16	0.2
311	4	C	870611	1030	23	0.3
312	4	C	870611	1030	16	0.1
313	4	C	870611	1030	16	0.2
314	4	C	870611	1030	15	0.1
315	4	C	870611	1030	16	0.1
316	1	C	870611	1030	99	-11.1
317	1	C	870611	1030	92	-11.1
318	1	C	870611	1030	91	-11.1
319	33	C	870611	1030	71	-11.1
320	33	C	870611	1030	69	-11.1
321	5	C	870611	1030	165	-11.1
322	5	C	870611	1030	154	-11.1
323	5	C	870611	1030	140	-11.1
324	30	C	870611	1030	-99	-11.1
325	30	C	870611	1030	-99	-11.1
326	31	C	870611	1030	-99	-11.1
327	31	C	870611	1030	-99	-11.1
328	31	C	870611	1030	-99	-11.1
329	31	C	870611	1030	-99	-11.1
330	31	C	870611	1030	-99	-11.1
331	1	C	870611	1030	-99	-11.1
332	1	C	870611	1030	-99	-11.1
333	1	C	870611	1030	-99	-11.1
334	1	C	870611	1030	-99	-11.1
335	1	C	870611	1030	-99	-11.1
336	1	C	870611	1030	-99	-11.1
337	1	C	870611	1030	-99	-11.1
338	1	C	870611	1030	-99	-11.1
339	1	C	870611	1030	-99	-11.1
340	1	C	870611	1030	-99	-11.1
341	1	C	870611	1030	-99	-11.1

FISHCOD	SPECIES	STATION	DATE	TIME	LENGTH	WEIGHT
342	1	C	870611	1030	-99	-11.1
343	1	C	870611	1030	-99	-11.1
344	1	C	870611	1030	-99	-11.1
345	1	C	870611	1030	285	-11.1
346	1	C	870611	1030	-99	-11.1
347	1	C	870611	1030	-99	-11.1
349	34	C	870611	1030	285	-11.1
350	34	C	870611	1030	188	-11.1
351	34	C	870611	1030	180	-11.1
352	31	D	870611	1140	48	1.9
353	31	D	870611	1140	44	1.4
354	31	D	870611	1140	46	1.6
355	31	D	870611	1140	50	1.8
356	31	D	870611	1140	45	1.4
357	31	D	870611	1140	43	1.4
358	31	D	870611	1140	46	1.5
359	31	D	870611	1140	44	1.4
360	31	D	870611	1140	44	1.3
361	31	D	870611	1140	42	1.2
362	31	D	870611	1140	42	1.2
363	31	D	870611	1140	44	1.2
364	31	D	870611	1140	42	1.1
365	31	D	870611	1140	41	1.1
366	31	D	870611	1140	35	0.8
367	31	D	870611	1140	33	0.5
368	30	D	870611	1140	28	0.3
369	33	D	870611	1140	-99	-11.1
370	33	D	870611	1140	-99	-11.1
371	33	D	870611	1140	-99	-11.1
372	33	D	870611	1140	-99	-11.1
373	33	D	870611	1140	-99	-11.1
374	31	D	870611	1140	60	-11.1
375	31	D	870611	1140	68	-11.1
376	31	D	870611	1140	69	-11.1
377	31	D	870611	1140	64	-11.1
378	31	D	870611	1140	62	-11.1
379	31	D	870611	1140	65	-11.1
380	31	D	870611	1140	-99	-11.1
381	31	D	870611	1140	-99	-11.1
382	31	D	870611	1140	-99	-11.1
383	31	D	870611	1140	-99	-11.1
384	31	D	870611	1140	-99	-11.1
385	31	D	870611	1140	-99	-11.1
386	31	D	870611	1140	-99	-11.1
387	31	D	870611	1140	-99	-11.1
388	31	D	870611	1140	-99	-11.1
389	34	D	870611	1140	331	-11.1
390	34	D	870611	1140	262	-11.1
391	34	D	870611	1140	279	-11.1

FISHCOD	SPECIES	STATION	DATE	TIME	LENGTH	WEIGHT
392	1	D	870611	1140	102	-11.1
393	1	D	870611	1140	108	-11.1
394	1	D	870611	1140	94	-11.1
395	1	D	870611	1140	91	-11.1
396	1	D	870611	1140	78	-11.1
397	1	D	870611	1140	88	-11.1
398	4	D	870611	1140	48	-11.1
519	33	D	870611	1800	66	4.6
520	33	D	870611	1800	63	3.4
521	33	D	870611	1800	67	4.5
522	33	D	870611	1800	64	4.5
523	33	D	870611	1800	65	4.0
524	31	D	870611	1800	58	3.0
525	31	D	870611	1800	54	2.4
526	31	D	870611	1800	50	1.9
527	31	D	870611	1800	48	1.5
528	31	D	870611	1800	44	1.3
529	31	D	870611	1800	47	1.5
530	31	D	870611	1800	41	1.0
531	31	D	870611	1800	43	1.0
532	31	D	870611	1800	31	0.4
533	31	D	870611	1800	32	0.5
534	31	D	870611	1800	36	0.7
535	30	D	870611	1800	35	0.7
536	31	D	870611	1800	-99	-11.1
537	31	D	870611	1800	-99	-11.1
538	31	D	870611	1800	-99	-11.1
539	31	D	870611	1800	-99	-11.1
540	34	D	870611	1800	251	-11.1
541	34	D	870611	1800	254	-11.1
542	34	D	870611	1800	382	-11.1
399	30	E	870611	1300	54	2.3
400	30	E	870611	1300	36	0.7
401	30	E	870611	1300	33	0.5
402	30	E	870611	1300	43	1.3
403	30	E	870611	1300	49	1.5
404	31	E	870611	1300	53	2.1
405	36	E	870611	1300	48	0.9
406	34	E	870611	1300	258	-11.1
407	34	E	870611	1300	190	-11.1
408	34	E	870611	1300	250	-11.1
409	34	E	870611	1300	153	-11.1
410	34	E	870611	1300	180	-11.1
411	34	E	870611	1300	174	-11.1
412	34	E	870611	1300	200	-11.1
413	34	E	870611	1300	330	-11.1
414	34	E	870611	1300	195	-11.1
415	34	E	870611	1300	207	-11.1
416	34	E	870611	1300	191	-11.1

FISHCOD	SPECIES	STATION	DATE	TIME	LENGTH	WEIGHT
417	34	E	870611	1300	179	-11.1
418	1	E	870611	1300	155	-11.1
419	1	E	870611	1300	210	-11.1
420	1	E	870611	1300	128	-11.1
421	1	E	870611	1300	130	-11.1
422	1	E	870611	1300	140	-11.1
423	1	E	870611	1300	105	-11.1
424	1	E	870611	1300	102	-11.1
425	1	E	870611	1300	100	-11.1
426	1	E	870611	1300	220	-11.1
427	1	E	870611	1300	112	-11.1
428	1	E	870611	1300	125	-11.1
429	1	E	870611	1300	138	-11.1
430	1	E	870611	1300	135	-11.1
431	1	E	870611	1300	105	-11.1
432	1	E	870611	1300	182	-11.1
433	1	E	870611	1300	137	-11.1
434	1	E	870611	1300	105	-11.1
435	1	E	870611	1300	130	-11.1
436	1	E	870611	1300	110	-11.1
437	1	E	870611	1300	100	-11.1
438	1	E	870611	1300	120	-11.1
439	1	E	870611	1300	145	-11.1
440	1	E	870611	1300	135	-11.1
441	1	E	870611	1300	135	-11.1
442	1	E	870611	1300	192	-11.1
443	1	E	870611	1300	152	-11.1
444	1	E	870611	1300	141	-11.1
445	1	E	870611	1300	85	-11.1
446	1	E	870611	1300	141	-11.1
447	1	E	870611	1300	172	-11.1
448	1	E	870611	1300	100	-11.1
449	1	E	870611	1300	110	-11.1
450	1	E	870611	1300	79	-11.1
451	1	E	870611	1300	95	-11.1
452	1	E	870611	1300	142	-11.1
453	1	E	870611	1300	94	-11.1
454	1	E	870611	1300	231	-11.1
455	3	E	870611	1300	55	-11.1
456	4	E	870611	1300	65	-11.1
457	4	E	870611	1300	194	-11.1
458	4	E	870611	1300	85	-11.1
459	4	E	870611	1300	78	-11.1
460	4	E	870611	1300	90	-11.1
461	4	E	870611	1300	91	-11.1
462	4	E	870611	1300	95	-11.1
463	4	E	870611	1300	78	-11.1
464	4	E	870611	1300	85	-11.1
465	4	E	870611	1300	125	-11.1

FISHCOD	SPECIES	STATION	DATE	TIME	LENGTH	WEIGHT
466	4	E	870611	1300	90	-11.1
467	4	E	870611	1300	110	-11.1
468	4	E	870611	1300	85	-11.1
469	4	E	870611	1300	120	-11.1
470	4	E	870611	1300	93	-11.1
471	4	E	870611	1300	85	-11.1
472	4	E	870611	1300	88	-11.1
473	4	E	870611	1300	98	-11.1
474	4	E	870611	1300	96	-11.1
475	4	E	870611	1300	82	-11.1
476	4	E	870611	1300	91	-11.1
477	4	E	870611	1300	82	-11.1
478	4	E	870611	1300	90	-11.1
479	4	E	870611	1300	85	-11.1
480	4	E	870611	1300	94	-11.1
481	4	E	870611	1300	96	-11.1
482	4	E	870611	1300	74	-11.1
483	4	E	870611	1300	80	-11.1
484	4	E	870611	1300	99	-11.1
485	4	E	870611	1300	99	-11.1
486	4	E	870611	1300	85	-11.1
487	4	E	870611	1300	88	-11.1
488	4	E	870611	1300	90	-11.1
489	4	E	870611	1300	72	-11.1
490	4	E	870611	1300	105	-11.1
491	4	E	870611	1300	94	-11.1
492	4	E	870611	1300	80	-11.1
493	4	E	870611	1300	85	-11.1
494	4	E	870611	1300	92	-11.1
495	4	E	870611	1300	84	-11.1
496	4	E	870611	1300	80	-11.1
497	4	E	870611	1300	115	-11.1
498	4	E	870611	1300	91	-11.1
499	4	E	870611	1300	85	-11.1
500	4	E	870611	1300	91	-11.1
501	4	E	870611	1300	72	-11.1
502	4	E	870611	1300	65	-11.1
503	4	E	870611	1300	74	-11.1
504	4	E	870611	1300	135	-11.1
505	4	E	870611	1300	75	-11.1
506	4	E	870611	1300	82	-11.1
507	4	E	870611	1300	96	-11.1
508	4	E	870611	1300	92	-11.1
509	4	E	870611	1300	85	-11.1
510	4	E	870611	1300	95	-11.1
511	4	E	870611	1300	72	-11.1
512	4	E	870611	1300	62	-11.1
513	4	E	870611	1300	129	-11.1
514	3	E	870611	1300	61	-11.1

FISHCOD	SPECIES	STATION	DATE	TIME	LENGTH	WEIGHT
515	3	E	870611	1300	60	-11.1
516	32	E	870611	1300	83	-11.1
517	33	E	870611	1300	75	-11.1
518	31	E	870611	1300	-99	-11.1
793	31	E	870611	1300	60	-11.1
813	6	E	870611	1300	-99	-11.1
543	1	E	870611	2000	151	-11.1
544	3	E	870611	2000	-99	-11.1
545	1	E	870611	2000	150	-11.1
546	30	E	870611	2000	-99	-11.1
547	37	E	870611	2000	130	-11.1
771	32	C	880629	1900	86	6.3
772	34	C	880629	1900	108	-11.1
773	3	C	880629	1900	61	-11.1
774	30	C	880629	1900	56	1.8
775	33	C	880629	1900	75	2.3
776	30	C	880629	1900	60	4.8
777	3	C	880629	1900	60	-11.1
721	1	D	880629	1745	36	-11.1
722	1	D	880629	1745	95	-11.1
723	1	D	880629	1745	85	-11.1
724	1	D	880629	1745	23	-11.1
725	1	D	880629	1745	21	-11.1
726	34	D	880629	1745	270	-11.1
727	4	D	880629	1745	21	-11.1
348	31	A	880630	1000	61	2.9
548	31	A	880630	1000	61	3.2
549	31	A	880630	1000	53	2.2
550	31	A	880630	1000	62	3.4
551	31	A	880630	1000	53	2.0
552	31	A	880630	1000	48	1.5
553	31	A	880630	1000	48	1.4
554	31	A	880630	1000	55	2.3
555	31	A	880630	1000	54	2.4
556	31	A	880630	1000	50	1.6
557	15	A	880630	1000	153	53.0
558	15	A	880630	1000	125	30.2
559	15	A	880630	1000	311	-11.1
560	15	A	880630	1000	187	-11.1
718	31	A	880630	1000	62	3.5
719	33	A	880630	1000	99	13.1
720	35	A	880630	1000	43	1.3
807	20	A	880630	1000	98	-11.1
808	20	A	880630	1000	50	-11.1
809	20	A	880630	1000	56	-11.1
698	31	B	880630	840	65	3.6
699	31	B	880630	840	61	3.0
700	31	B	880630	840	66	3.9
701	31	B	880630	840	57	2.8

FISHCOD	SPECIES	STATION	DATE	TIME	LENGTH	WEIGHT
702	31	B	880630	840	60	3.1
703	31	B	880630	840	53	2.2
704	31	B	880630	840	51	1.8
705	31	B	880630	840	52	2.2
706	31	B	880630	840	64	3.4
707	31	B	880630	840	48	1.9
708	31	B	880630	840	53	2.0
709	31	B	880630	840	56	2.7
710	31	B	880630	840	52	2.1
711	31	B	880630	840	46	1.6
712	31	B	880630	840	42	1.1
713	31	B	880630	840	48	1.5
714	31	B	880630	840	44	1.1
715	33	B	880630	840	77	6.8
716	33	B	880630	840	70	5.9
717	33	B	880630	840	72	5.3
728	33	C	880630	1230	77	6.0
729	31	C	880630	1230	59	2.9
730	31	C	880630	1230	64	3.6
731	30	C	880630	1230	46	1.6
732	1	C	880630	1230	20	0.1
733	1	C	880630	1230	20	0.2
734	1	C	880630	1230	20	0.2
735	1	C	880630	1230	25	0.3
736	1	C	880630	1230	25	0.2
737	1	C	880630	1230	14	0.1
738	1	C	880630	1230	20	0.2
739	1	C	880630	1230	20	0.2
740	1	C	880630	1230	20	0.2
741	1	C	880630	1230	20	0.2
742	1	C	880630	1230	21	0.3
743	1	C	880630	1230	21	0.3
744	1	C	880630	1230	21	0.3
745	1	C	880630	1230	19	0.1
746	1	C	880630	1230	19	0.1
747	1	C	880630	1230	20	0.2
748	1	C	880630	1230	20	0.2
749	1	C	880630	1230	21	0.3
750	1	C	880630	1230	21	0.3
751	1	C	880630	1230	20	0.2
752	1	C	880630	1230	19	0.1
753	1	C	880630	1230	21	0.3
754	1	C	880630	1230	20	0.2
755	1	C	880630	1230	20	0.2
756	1	C	880630	1230	20	0.2
757	1	C	880630	1230	20	0.2
758	1	C	880630	1230	19	0.3
759	1	C	880630	1230	20	0.2
760	1	C	880630	1230	20	0.2

FISHCOD	SPECIES	STATION	DATE	TIME	LENGTH	WEIGHT
761	1	C	880630	1230	20	0.2
762	1	C	880630	1230	20	0.2
763	1	C	880630	1230	21	0.3
764	1	C	880630	1230	20	0.2
765	1	C	880630	1230	19	0.1
766	1	C	880630	1230	20	0.2
767	1	C	880630	1230	21	0.3
768	1	C	880630	1230	20	0.2
769	1	C	880630	1230	21	0.3
770	34	C	880630	1230	286	-11.1
810	1	C	880630	1230	97	-11.1
811	1	C	880630	1230	62	-11.1
580	33	D	880630	1130	75	5.7
581	33	D	880630	1130	71	5.8
582	33	D	880630	1130	79	6.9
583	31	D	880630	1130	63	3.6
584	31	D	880630	1130	62	3.7
585	31	D	880630	1130	56	2.6
586	31	D	880630	1130	56	2.2
587	30	D	880630	1130	51	1.8
588	1	D	880630	1130	30	0.5
589	4	D	880630	1130	128	-11.1
590	43	D	880630	1130	325	-11.1
591	43	D	880630	1130	175	-11.1
592	34	D	880630	1130	295	-11.1
593	34	D	880630	1130	248	-11.1
594	34	D	880630	1130	211	-11.1
595	33	D	880630	1130	75	5.7
596	33	D	880630	1130	70	5.3
597	31	D	880630	1130	56	2.3
598	31	D	880630	1130	43	1.0
599	31	D	880630	1130	36	0.4
600	30	D	880630	1130	34	0.4
601	30	D	880630	1130	45	1.3
602	30	D	880630	1130	53	1.9
603	30	D	880630	1130	39	0.7
604	34	D	880630	1130	348	-11.1
605	34	D	880630	1130	295	-11.1
606	34	D	880630	1130	382	-11.1
607	34	D	880630	1130	299	-11.1
608	33	D	880630	1130	80	-11.1
609	1	D	880630	1130	117	-11.1
610	1	D	880630	1130	122	-11.1
611	1	D	880630	1130	97	-11.1
612	1	D	880630	1130	105	-11.1
613	1	D	880630	1130	119	-11.1
614	1	D	880630	1130	95	-11.1
615	1	D	880630	1130	111	-11.1
616	1	D	880630	1130	84	-11.1

FISHCOD	SPECIES	STATION	DATE	TIME	LENGTH	WEIGHT
617	1	D	880630	1130	98	-11.1
618	1	D	880630	1130	102	-11.1
619	1	D	880630	1130	97	-11.1
620	1	D	880630	1130	119	-11.1
621	1	D	880630	1130	98	-11.1
622	1	D	880630	1130	88	-11.1
623	1	D	880630	1130	64	-11.1
624	1	D	880630	1130	75	-11.1
625	1	D	880630	1130	85	-11.1
626	1	D	880630	1130	77	-11.1
627	1	D	880630	1130	95	-11.1
628	1	D	880630	1130	100	-11.1
629	1	D	880630	1130	81	-11.1
630	1	D	880630	1130	118	-11.1
631	4	D	880630	1130	50	-11.1
632	20	D	880630	1130	52	-11.1
778	30	D	880630	1130	37	-11.1
779	30	D	880630	1130	64	-11.1
780	30	D	880630	1130	52	-11.1
781	30	D	880630	1130	43	-11.1
782	30	D	880630	1130	48	-11.1
783	30	D	880630	1130	39	-11.1
784	30	D	880630	1130	43	-11.1
785	32	D	880630	1130	71	-11.1
786	31	D	880630	1130	69	-11.1
787	1	D	880630	1130	105	-11.1
788	1	D	880630	1130	91	-11.1
789	1	D	880630	1130	27	-11.1
790	1	D	880630	1130	115	-11.1
794	1	D	880630	1130	88	-11.1
795	1	D	880630	1130	89	-11.1
796	1	D	880630	1130	90	-11.1
797	1	D	880630	1130	109	-11.1
798	1	D	880630	1130	89	-11.1
799	1	D	880630	1130	99	-11.1
800	1	D	880630	1130	89	-11.1
801	1	D	880630	1130	105	-11.1
802	1	D	880630	1130	82	-11.1
803	1	D	880630	1130	101	-11.1
804	1	D	880630	1130	89	-11.1
805	1	D	880630	1130	78	-11.1
806	1	D	880630	1130	102	-11.1
572	43	E	880630	2100	185	-11.1
573	5	E	880630	2100	126	-11.1
574	5	E	880630	2100	107	-11.1
575	1	E	880630	2100	120	-11.1
576	34	E	880630	2100	310	-11.1
577	30	E	880630	2100	47	1.3
578	33	E	880630	2100	62	3.3

FISHCOD	SPECIES	STATION	DATE	TIME	LENGTH	WEIGHT
579	33	E	880630	2100	72	5.4
633	33	E	880630	2100	78	5.9
634	33	E	880630	2100	68	4.3
635	33	E	880630	2100	67	4.1
636	1	E	880630	2100	178	-11.1
637	1	E	880630	2100	108	-11.1
638	5	E	880630	2100	102	-11.1
639	1	E	880630	2100	125	-11.1
640	5	E	880630	2100	88	-11.1
641	5	E	880630	2100	89	-11.1
642	5	E	880630	2100	85	-11.1
643	30	E	880630	2100	54	-11.1
812	34	E	880630	2100	-99	-11.1
561	33	E	880701	1200	83	6.9
562	34	E	880701	1200	192	-11.1
563	34	E	880701	1200	221	-11.1
564	34	E	880701	1200	228	-11.1
565	3	E	880701	1200	66	-11.1
566	3	E	880701	1200	62	-11.1
567	5	E	880701	1200	92	-11.1
568	5	E	880701	1200	66	-11.1
569	5	E	880701	1200	42	-11.1
570	1	E	880701	1200	162	-11.1
571	37	E	880701	1200	162	-11.1
644	1	E	880701	1200	150	49.5
645	1	E	880701	1200	149	48.4
646	1	E	880701	1200	111	20.0
647	1	E	880701	1200	107	16.3
648	1	E	880701	1200	92	9.3
649	30	E	880701	1200	54	2.0
650	5	E	880701	1200	44	-11.1
651	5	E	880701	1200	45	-11.1
652	5	E	880701	1200	119	-11.1
653	5	E	880701	1200	105	-11.1
654	5	E	880701	1200	100	-11.1
655	5	E	880701	1200	101	-11.1
656	5	E	880701	1200	102	-11.1
657	5	E	880701	1200	105	-11.1
658	34	E	880701	1200	221	-11.1
659	34	E	880701	1200	198	-11.1
660	34	E	880701	1200	206	-11.1
661	34	E	880701	1200	214	-11.1
662	34	E	880701	1200	164	-11.1
663	34	E	880701	1200	321	-11.1
664	34	E	880701	1200	174	-11.1
665	37	E	880701	1200	192	-11.1
666	23	E	880701	1200	189	-11.1
667	43	E	880701	1200	227	-11.1
668	1	E	880701	1200	114	19.8

FISHCOD	SPECIES	STATION	DATE	TIME	LENGTH	WEIGHT
669	1	E	880701	1200	98	10.8
670	1	E	880701	1200	94	11.2
671	1	E	880701	1200	121	22.1
672	1	E	880701	1200	92	9.3
673	1	E	880701	1200	43	1.0
674	5	E	880701	1200	192	-11.1
675	5	E	880701	1200	166	-11.1
676	5	E	880701	1200	113	-11.1
677	5	E	880701	1200	135	-11.1
678	5	E	880701	1200	209	-11.1
679	5	E	880701	1200	149	-11.1
680	5	E	880701	1200	130	-11.1
681	5	E	880701	1200	161	-11.1
682	5	E	880701	1200	131	-11.1
683	5	E	880701	1200	128	-11.1
684	5	E	880701	1200	136	-11.1
685	5	E	880701	1200	155	-11.1
686	5	E	880701	1200	107	-11.1
687	5	E	880701	1200	135	-11.1
688	5	E	880701	1200	116	-11.1
689	5	E	880701	1200	145	-11.1
690	5	E	880701	1200	55	-11.1
691	5	E	880701	1200	56	-11.1
692	34	E	880701	1200	257	-11.1
693	34	E	880701	1200	173	-11.1
694	34	E	880701	1200	186	-11.1
695	30	E	880701	1200	56	-11.1
696	30	E	880701	1200	55	-11.1
697	30	E	880701	1200	48	-11.1

Table 6. Temperature (T°C), salinity (‰), current ($m \cdot s^{-1}$) during high and low tide levels at the surface in the Homathko River and estuary.

STATION	DATE	TIME	TIDE	TEMP	SAL	CURR
A	870610	1620	1	7.3	0	0.05

STATION	DATE	TIME	TIDE	TEMP	SAL	CURR
B	870610	1720	1	6.9	0	0.05

STATION	DATE	TIME	TIDE	TEMP	SAL	CURR
B	870610	1720	1	6.9	0	0.05

STATION	DATE	TIME	TIDE	TEMP	SAL	CURR
B	870610	1720	1	6.9	0	0.05

STATION	DATE	TIME	TIDE	TEMP	SAL	CURR
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
B	870610	1720	1	6.9	0	0.05
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00

STATION	DATE	TIME	TIDE	TEMP	SAL	CURR
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00
C	870610	1800	1	6.9	0	0.00
C	870611	1030	2	6.3	0	0.47
C	870611	1030	2	6.3	0	0.47
C	870611	1030	2	6.3	0	0.47
C	870611	1030	2	6.3	0	0.47
C	870611	1030	2	6.3	0	0.47
C	870611	1030	2	6.3	0	0.47
C	870611	1030	2	6.3	0	0.47
C	870611	1030	2	6.3	0	0.47
C	870611	1030	2	6.3	0	0.47
C	870611	1030	2	6.3	0	0.47
C	870611	1030	2	6.3	0	0.47
C	870611	1030	2	6.3	0	0.47
C	870611	1030	2	6.3	0	0.47
C	870611	1030	2	6.3	0	0.47
C	870611	1030	2	6.3	0	0.47
C	870611	1030	2	6.3	0	0.47
C	870611	1030	2	6.3	0	0.47
C	870611	1030	2	6.3	0	0.47
C	870611	1030	2	6.3	0	0.47
C	870611	1030	2	6.3	0	0.47
C	870611	1030	2	6.3	0	0.47
C	870611	1030	2	6.3	0	0.47
C	870611	1030	2	6.3	0	0.47

STATION	DATE	TIME	TIDE	TEMP	SAL	CURR
C	870611	1030	2	6.3	0	0.47

STATION	DATE	TIME	TIDE	TEMP	SAL	CURR
C	870611	1030	2	6.3	0.0	0.47
C	870611	1030	2	6.3	0.0	0.47
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	0.3	0.00
D	870611	1140	2	7.4	2.3	0.00
D	870611	1800	1	6.7	0.0	0.05

STATION	DATE	TIME	TIDE	TEMP	SAL	CURR
D	870611	1800	1	6.7	0.0	0.05

STATION	DATE	TIME	TIDE	TEMP	SAL	CURR
E	870611	1300	2	8.2	0.9	0

STATION	DATE	TIME	TIDE	TEMP	SAL	CURR
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	1300	2	8.2	0.9	0.00
E	870611	2000	1	7.6	0.4	0.03
E	870611	2000	1	7.6	0.4	0.03
E	870611	2000	1	7.6	0.4	0.03
E	870611	2000	1	7.6	0.4	0.03
E	870611	2000	1	7.6	0.4	0.03

STATION	DATE	TIME	TIDE	TEMP	SAL	CURR
C	880629	1900	1	8.4	0.7	0.00
C	880629	1900	1	8.4	0.7	0.00
C	880629	1900	1	8.4	0.7	0.00
C	880629	1900	1	8.4	0.7	0.00
C	880629	1900	1	8.4	0.7	0.00
C	880629	1900	1	8.4	0.7	0.00
C	880629	1900	1	8.4	0.7	0.00
D	880629	1745	1	8.8	0.0	0.00
D	880629	1745	1	8.8	0.0	0.00
D	880629	1745	1	8.8	0.0	0.00
D	880629	1745	1	8.8	0.0	0.00
D	880629	1745	1	8.8	0.0	0.00
D	880629	1745	1	8.8	0.0	0.00
D	880629	1745	1	8.8	0.0	0.00
A	880630	1000	1	7.5	0.0	0.34
A	880630	1000	1	7.5	0.0	0.34
A	880630	1000	1	7.5	0.0	0.34
A	880630	1000	1	7.5	0.0	0.34
A	880630	1000	1	7.5	0.0	0.34
A	880630	1000	1	7.5	0.0	0.34
A	880630	1000	1	7.5	0.0	0.34
A	880630	1000	1	7.5	0.0	0.34
A	880630	1000	1	7.5	0.0	0.34
A	880630	1000	1	7.5	0.0	0.34
A	880630	1000	1	7.5	0.0	0.34
A	880630	1000	1	7.5	0.0	0.34
A	880630	1000	1	7.5	0.0	0.34
A	880630	1000	1	7.5	0.0	0.34
A	880630	1000	1	7.5	0.0	0.34
A	880630	1000	1	7.5	0.0	0.34
A	880630	1000	1	7.5	0.0	0.34
A	880630	1000	1	7.5	0.0	0.34
A	880630	1000	1	7.5	0.0	0.34
A	880630	1000	1	7.5	0.0	0.34
A	880630	1000	1	7.5	0.0	0.34
B	880630	840	1	6.9	0.0	0.25
B	880630	840	1	6.9	0.0	0.25
B	880630	840	1	6.9	0.0	0.25
B	880630	840	1	6.9	0.0	0.25
B	880630	840	1	6.9	0.0	0.25
B	880630	840	1	6.9	0.0	0.25
B	880630	840	1	6.9	0.0	0.25
B	880630	840	1	6.9	0.0	0.25
B	880630	840	1	6.9	0.0	0.25
B	880630	840	1	6.9	0.0	0.25
B	880630	840	1	6.9	0.0	0.25
B	880630	840	1	6.9	0.0	0.25
B	880630	840	1	6.9	0.0	0.25
B	880630	840	1	6.9	0.0	0.25
B	880630	840	1	6.9	0.0	0.25

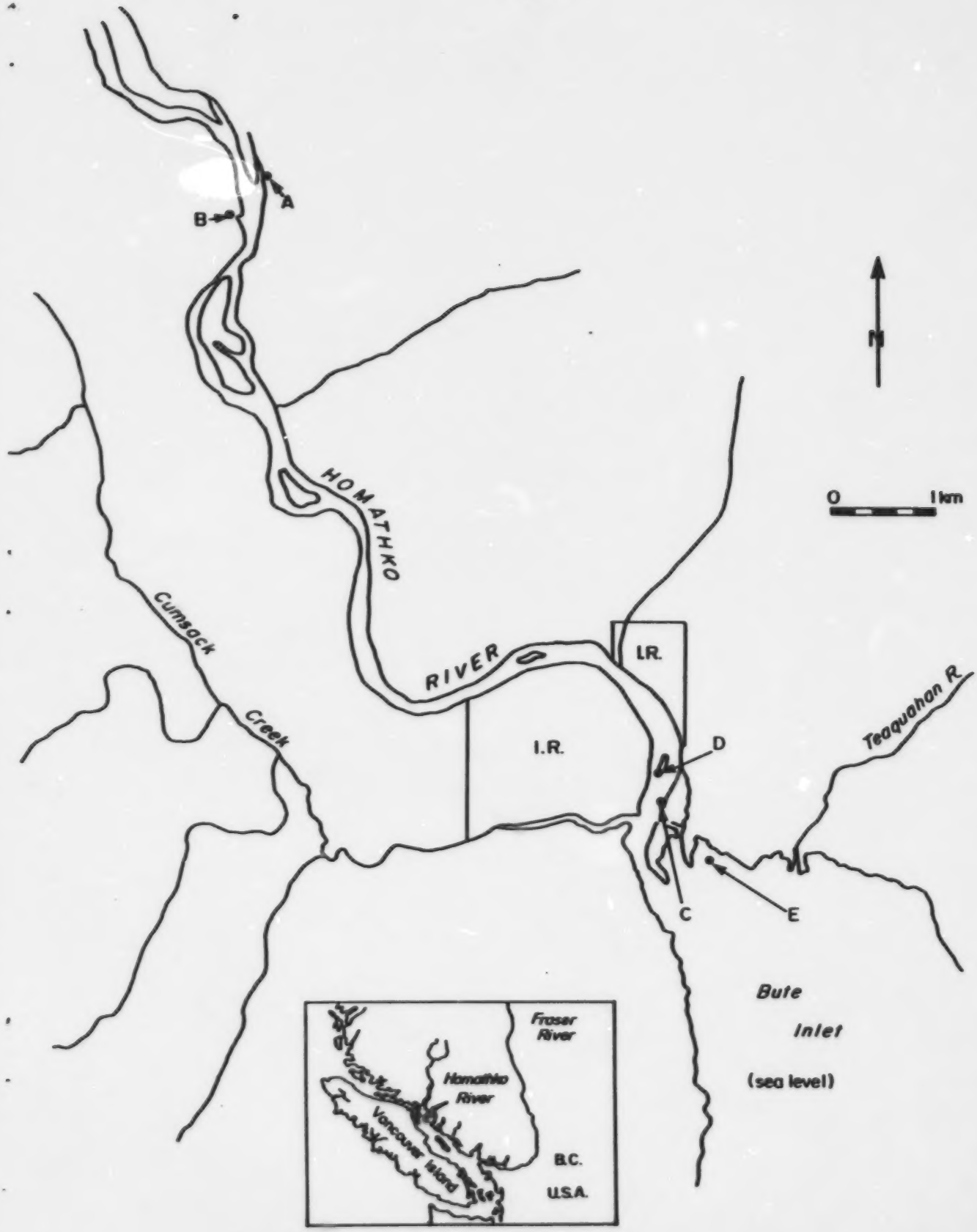
STATION	DATE	TIME	TIDE	TEMP	SAL	CURR
B	880630	840	1	6.9	0	0.25
B	880630	840	1	6.9	0	0.25
B	880630	840	1	6.9	0	0.25
B	880630	840	1	6.9	0	0.25
C	880630	1230	2	7.2	0	0.19

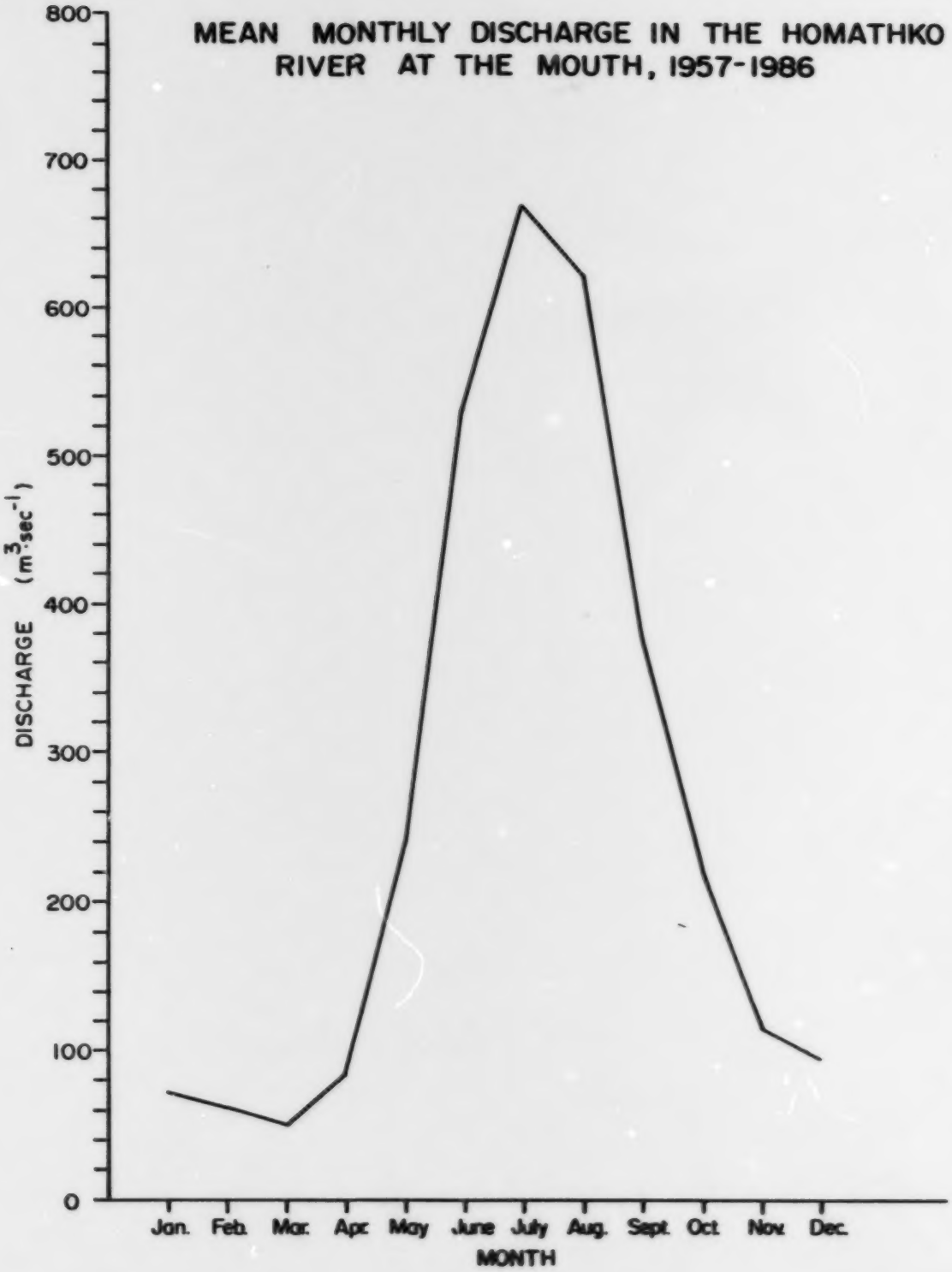
STATION	DATE	TIME	TIDE	TEMP	SAL	CURR
D	880630	1130	2	7.8	0	0.28

STATION	DATE	TIME	TIDE	TEMP	SAL	CURR
D	880630	1130	2	7.8	0.0	0.28
D	880630	1130	2	7.8	0.0	0.28
D	880630	1130	2	7.8	0.0	0.28
D	880630	1130	2	7.8	0.0	0.28
D	880630	1130	2	7.8	0.0	0.28
D	880630	1130	2	7.8	0.0	0.28
D	880630	1130	2	7.8	0.0	0.28
D	880630	1130	2	7.8	0.0	0.28
D	880630	1130	2	7.8	0.0	0.28
D	880630	1130	2	7.8	0.0	0.28
D	880630	1130	2	7.8	0.0	0.28
D	880630	1130	2	7.8	0.0	0.28
D	880630	1130	2	7.8	0.0	0.28
D	880630	1130	2	7.8	0.0	0.28
D	880630	1130	2	7.8	0.0	0.28
D	880630	1130	2	7.8	0.0	0.28
D	880630	1130	2	7.8	0.0	0.28
D	880630	1130	0	7.8	0.0	0.28
D	880630	1130	2	7.8	0.0	0.28
D	880630	1130	2	7.8	0.0	0.28
D	880630	1130	2	7.8	0.0	0.28
D	880630	1130	2	7.8	0.0	0.28
D	880630	1130	2	7.8	0.0	0.28
D	880630	1130	2	7.8	0.0	0.28
D	880630	1130	2	7.8	0.0	0.28
D	880630	1130	2	7.8	0.0	0.28
D	880630	1130	2	7.8	0.0	0.28
D	880630	1130	2	7.8	0.0	0.28
E	880630	2100	1	9.7	0.1	0.00
E	880630	2100	1	9.7	0.1	0.00
E	880630	2100	1	9.7	0.1	0.00
E	880630	2100	1	9.7	0.1	0.00
E	880630	2100	1	9.7	0.1	0.00
E	880630	2100	1	9.7	0.1	0.00
E	880630	2100	1	9.7	0.1	0.00
E	880630	2100	1	9.7	0.1	0.00
E	880630	2100	1	9.7	0.1	0.00
E	880630	2100	1	9.7	0.1	0.00
E	880630	2100	1	9.7	0.1	0.00
E	880630	2100	1	9.7	0.1	0.00
E	880630	2100	1	9.7	0.1	0.00
E	880630	2100	1	9.7	0.1	0.00
E	880630	2100	1	9.7	0.1	0.00
E	880630	2100	1	9.7	0.1	0.00
E	880630	2100	1	9.7	0.1	0.00
E	880630	2100	1	9.7	0.1	0.00
E	880630	2100	1	9.7	0.1	0.00
E	880630	2100	1	9.7	0.1	0.00
E	880630	2100	1	9.7	0.1	0.00
E	880701	1200	2	8.1	0.5	0.00
E	880701	1200	2	8.1	0.5	0.00

STATION	DATE	TIME	TIDE	TEMP	SAL	CURR
E	880701	1200	2	8.1	0.5	0

STATION	DATE	TIME	TIDE	TEMP	SAL	CURR
E	880701	1200	2	8.1	0.5	0
E	880701	1200	2	8.1	0.5	0
E	880701	1200	2	8.1	0.5	0
E	880701	1200	2	8.1	0.5	0
E	880701	1200	2	8.1	0.5	0
E	880701	1200	2	8.1	0.5	0
E	880701	1200	2	8.1	0.5	0
E	880701	1200	2	8.1	0.5	0
E	880701	1200	2	8.1	0.5	0
E	880701	1200	2	8.1	0.5	0
E	880701	1200	2	8.1	0.5	0
E	880701	1200	2	8.1	0.5	0
E	880701	1200	2	8.1	0.5	0
E	880701	1200	2	8.1	0.5	0


A
B
HOMATHKO
RIVER
Cumsack
Creek
I.R.
I.R.
D
C
E
Teaquahon R.
N
0
1 km
Bute
Inlet
(sea level)
Fraser
River
Homathko
River
Vancouver Island
B.C.
U.S.A.


MEAN MONTHLY DISCHARGE IN THE HOMATHKO RIVER AT THE MOUTH, 1957-1986
DISCHARGE ($m^3 \cdot sec^{-1}$)
800
700
600
500
400
300
200
100
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sept.
Oct.
Nov.
Dec.
MONTH